

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following discussion, is respectfully requested.

Claims 1, 2, and 4-21 are pending in the application. Claims 1, 7, 15, and 17 are currently amended. Support for amended Claims 1 and 15 can be found in the published application at paragraph [0088] and Figure 2, for example. Support for amended Claims 7 and 17 is self-evident. No new matter is introduced.

In the outstanding Office Action, Claims 7-9, 11, and 17-19 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claims 1, 2, 5-8, 11, 12, 15-18, and 21 were rejected under 35 U.S.C. § 103(a) as unpatentable over Steuer (GB 929326 hereinafter “Steuer ‘326”) in view of Yoshida (US 2002/0183146). Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Steuer ‘326 in view of Yoshida and Fritzer (U.S. Patent No. 6,786,844). Claims 9, 10, 19, and 20 were rejected under 35 U.S.C. § 103(a) as unpatentable over Steuer ‘326 in view of Yoshida and Steuer (U.S. Patent No. 4,350,491 hereinafter “Steuer ‘491”).

With regard to the rejection under 35 U.S.C. § 112(1), Applicants respectfully assert that the features described in Claims 7-9, 11, and 17-19 were described in the specification as originally filed in such a way as to enable one skilled in the art to make and/or use the invention. For example, paragraph [0090] of the printed publication states:

[T]he hydraulic pressure chamber 57 is *provided in series* with the hydraulic motor 550 in the axial direction of the primary shaft 51 so that hydraulic pressure within the hydraulic pressure chamber 57 can push the movable sheave 53 toward the toward the fixed sheave 52. As a result, output from the hydraulic motor 550 can be reduced, which enables the hydraulic motor 550 to be made smaller. (Emphasis added.)

One of ordinary skill in the art would recognize that the axial force converted from the rotation of the motor by the recited moving direction converting mechanism and the force

generated by the hydraulic pressure chamber work in series to move the movable sheave. Accordingly, the hydraulic pressure chamber and the hydraulic motor work in **conjunction** with one another and do not interfere with one another as asserted by the Office Action.

Moreover, the transmission described in the specification as originally filed presents several advantages over conventional arrangements. For example, by providing a hydraulic pressure chamber in series with the hydraulic motor, response during a speed ratio change may be improved.¹ Furthermore, the consumption amount of the hydraulic fluid supplied from the oil pump may be reduced which in turn enables the oil pump to be made smaller, for example.² Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 112(1) be withdrawn.

Amended independent Claim 1 recites a belt type continuously variable transmission including two pulley shafts, a movable sheave on each pulley shaft, and a fixed sheave arranged on each pulley shaft so as to face the movable sheave. Amended Claim 1 also recites a motor that drives one of the movable sheaves in the axial direction of a pulley shaft and a moving direction converting mechanism that converts force in the direction of rotation into force in the axial direction. Amended Claim 1 further recites a hydraulic pressure chamber, which pushes the one movable sheave toward the fixed sheave using hydraulic pressure, is *provided between the motor and an inner radial surface of the one movable sheave in the axial direction*. Furthermore, amended Claim 1 recites that the moving direction converting mechanism is *disposed between an outer peripheral portion of the outer rotor and an inner circumferential wall surface of the hollow portion of the movable sheave*.

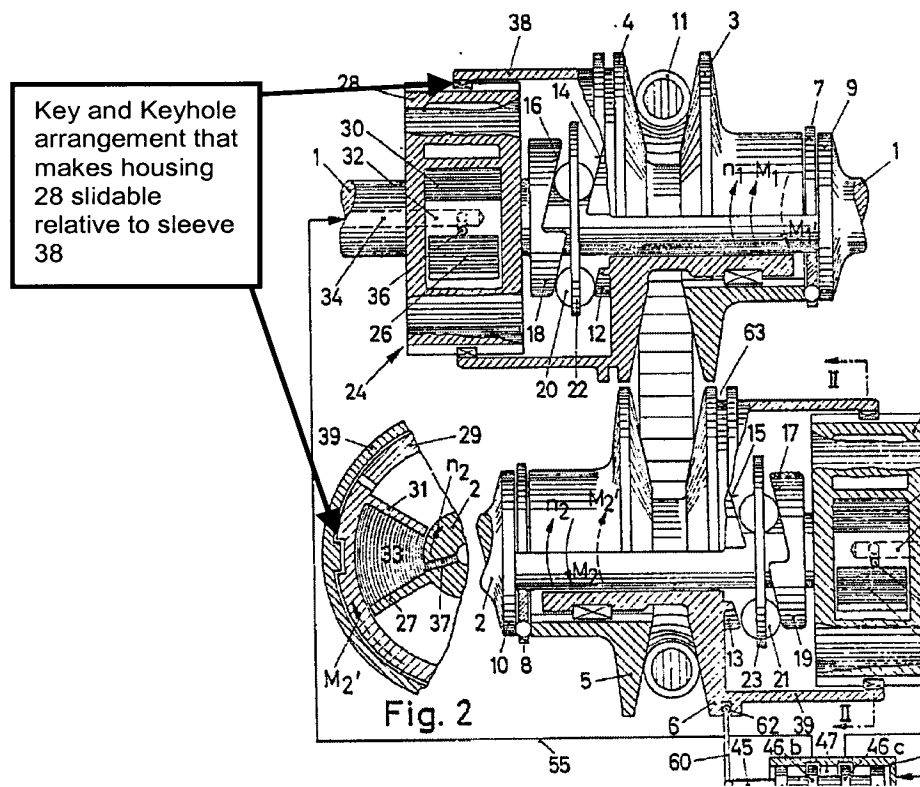
Turning to the applied references, Figure 1 of Steuer '326 illustrates conical disks 3 and 4, cam tracks 14 and 16, and balls 20 provided between the cam tracks.³ Steuer '326 also

¹ See the published application at paragraph [0093].

² Id.

³ See Steuer '326 at page 4, lines 40-75.

describes a rotary piston 24 enclosed in a housing 28 which is mounted on shaft 1.⁴ As can be appreciated by the annotated copy of Figure 2 of Steuer '326 below, movable disk 4 is provided with sleeve 38 which extends over the housing 28 of the rotary piston through **keys** on the sleeves which engage **keyways** in the housing.⁵ In particular, Steuer '326 states that the housing is not rotatable relative to the associated disk and that the connecting sleeve of the disk is *slidable* in the axial direction relative to the rotary piston housing.⁶



Steuer '326 describes that a torque applied by the rotary piston 24 causes the movable disk 4 to rotate via the coupling sleeve 38.⁷ This rotation of the movable disk 4 causes the ball 20 to climb along the cam tracks 14 and 16, which accordingly causes the movable disk 4 to shift in the axial direction toward the fixed disk 3.⁸ However, Steuer '326 does not suggest

⁴ See Steuer '326 at page 4, lines 85-110.
⁵ See Steuer '326 at page 4, lines 105-115.
⁶ See Steuer '326 at page 4, lines 115-120, emphasis added.
⁷ See Steuer '326 at page 5, lines 4-8.
⁸ See Steuer '326 at page 6, lines 1-14.

or disclose a moving direction converting mechanism disposed between an outer peripheral portion of an outer rotor and an inner circumferential inner wall surface of a hollow portion of a movable sheave.

The Office Action acknowledges that Steuer '326 does not suggest or disclose this feature, and accordingly applies the Yoshida reference to cure this deficiency. Yoshida merely describes a belt type infinite variable-speed drive including a ball screw mechanism 5.⁹ Yoshida describes that the ball screw mechanism 5 includes a threaded shaft 11 which is rotated through gear 20 which slidably meshes with gear 19 rotated by a motor (not shown).¹⁰ Yoshida describes that the threaded shaft 11 moves in the axial direction relative to the fixed nut 12 while rotating around the movable pulley member 3, thereby pushing the movable pulley member 3 toward the fixed pulley member 2.¹¹ However, Yoshida does not suggest or disclose a moving direction converting mechanism that is **disposed between the outer peripheral portion of the outer rotor and the inner circumferential wall surface of the hollow portion of the movable sheave.**

Moreover, there is no apparent reason to combine the ball screw mechanism of Yoshida with the apparatus of Steuer '326 beyond impermissible hindsight. MPEP § 2143.01(V) states, "if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose then there is no suggestion or motivation to make the proposed modification."¹² Steuer '326 explicitly requires that the rotary piston housing 28 **not** rotate relative to the coupling sleeve 38 of the movable disk 4 via the described keyend and keyways. As Steuer '326 was specifically designed such that the motor housing and the movable disk be **slidable** with respect to each other, making them relatively rotatable would render the apparatus uncontrollable given the described cam and ball

⁹ See Yoshida at paragraph [0027].

¹⁰ See Yoshida at paragraph [0032].

¹¹ See Yoshida at paragraph [0034].

¹² Quoting *In re Gordon*, 733 F.2d 900, 221, USPQ 1125 (Fed. Cir. 1984).

arrangement. Therefore, not only does Yoshida fail to disclose all the features recited in amended independent Claim 1, the combination of Yoshida with Steuer '326 as suggested by the Office Action would render Steuer '326 unsatisfactory for its intended purpose.

Further, neither Steuer '326 nor Yoshida suggest or disclose a hydraulic pressure chamber, which pushes the one movable sheave toward the fixed sheave using hydraulic pressure, that is provided between the motor and an inner radial surface of the one movable sheave in the axial direction. Steuer '491 fails to cure this deficiency. Steuer '491 describes a piston 9 connected to shaft 1 such that transmission of torque between shaft 1 and pulley 4 is effected via the shaped groove 34 in the outer peripheral wall of neck 35 and a ball 33 held by piston 9 that is urged against the groove by the piston rod 28.¹³ Figure 1 of Steuer '491 also illustrates a pressure chamber 10 formed between cone-pulley 4 and piston 9.¹⁴ However, Steuer '491 does not suggest or disclose a hydraulic pressure chamber that is provided *between the motor and an inner radial surface of the one movable sheave in the axial direction*.

The piston 9 described by Steuer '491 merely provides a mechanism to transfer the torque between shaft 1 and pulley 4. The piston 9 of Steuer '491 does not **drive one of the movable sheaves in the axial direction of a pulley shaft** as recited in amended Claim 1. Therefore, Steuer '491 does not suggest or disclose the recited arrangement of the motor and the hydraulic pressure chamber recited in amended Claim 1.

Moreover, there is no suggestion or motivation to combine the hydraulic chamber described in Steuer '491 with the apparatus of Steuer '326. As illustrated in Figure 1 of Steuer '326, the area between the rotary piston housing 28 and the movable disk 4 is occupied by the cam and ball arrangement. As described above, replacing the cam ball

¹³ See Steuer '491 at column 4, lines 6-16.

¹⁴ See Steuer '491 at column 3, lines 62-65.

arrangement with the hydraulic pressure chamber of Steuer '491 would render the apparatus of Steuer '326 unsatisfactory for its intended purpose.

Fritzer which was applied for features other than the moving direction converting mechanism and the hydraulic pressure chamber fails to cure the deficiencies of the other cited references.

Based on the foregoing, the combined teachings of Steuer '326, Yoshida, Steuer '491, and Fritzer do not suggest or disclose all the features of amended Claim 1. Accordingly, Applicants respectfully submit that amended Claim 1 is in condition for allowance.

Amended independent Claim 15 recites a belt type continuously variable transmission that includes the above argued features of amended Claim 1. Accordingly, Applicants respectfully submit that amended Claim 15 is in condition for allowance for at least the same reasons as amended Claim 1.

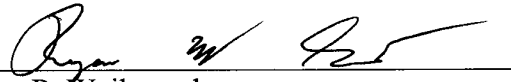
The dependent claims are respectfully submitted to be in condition for allowance for at least the same reasons as the independent claims from which they depend. Moreover, the dependent claims recite additional features not suggested or disclosed by the cited references.

For the reasons discussed above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for Claims 1, 2, and 4-21 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the Applicants' representative at the below listed telephone number.

Respectfully submitted,

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